

WHAT IS CLAIMED IS:

1. An apparatus for image processing comprising:  
a first compressing section which compresses each  
block of an image into first compressed data;

5       a first code converting section which converts the  
first compressed data into second compressed data so  
that each block of the second compressed data has a  
code length equal to or different from that of each  
block of the first code length;

10       a second code converting section which converts  
the second compressed data into third compressed data  
so that each block of the third compressed data has a  
code length equal to that of each block of the first  
code length; and

15       a decoding section which decodes the third  
compressed data.

2. The apparatus for image processing according  
to claim 1, wherein the decoding section also decodes  
the first compressed data.

20       3. The apparatus for image processing according  
to claim 1, further comprising a color determining  
section which determines whether the image is colored  
or monochromatic,

      wherein the first code converting section converts  
25       the first compressed data into the second compressed  
data in accordance with the result of the determination  
by the color determining section so that each block of

the second compressed data has a code length equal to or different from that of each block of the first compressed data, and

5       the first code converting section converts the second compressed data into the third compressed data in accordance with the result of the determination by the color determining section so that each block of the third compressed data has a code length equal to that of each block of the second compressed data.

10       4. The apparatus for image processing according to claim 1, wherein the decoding section executes decoding the compressed data in a code format of the first compressed data, and

15       the second code converting section converts the second compressed data into the third compressed data so that each block of the third compressed data has a code length and a code format equal to those of each block of the first compressed data.

20       5. The apparatus for image processing according to claim 1, wherein if the third compressed data has a code format different from that of the first compressed data, the decoding section decodes the third compressed data by converting the code format of the third compressed data into a code format of the first  
25       compressed data.

6. The apparatus for image processing according to claim 1, further comprising mode instructing means

for instructing on a mode for image processing,

wherein the first code converting section converts the first compressed data into the second compressed data in accordance with the mode instructed on by the mode instructing means so that each block of the second compressed data has a code length equal to or different from that of each block of the first compressed data, and

the first code converting section converts the second compressed data into the third compressed data so that each block of the third compressed data has a code length equal to that of each block of the first compressed data.

7. The apparatus for image processing according to claim 1, further comprising a memory which stores the third compressed data;

a color determining section which determines whether the image is colored or monochromatic; and

mode instructing means for instructing on a mode for image processing,

wherein the decoding section decodes the third compressed data read from the memory,

in accordance with at least either a color determination result produced by the color determining section or the mode instructed on by the mode instructing means, the first code converting section converts the first compressed data into the second

compressed data so that each block of the second compressed data has a code length equal to or different from that of each block of the first compressed data, and

5           the memory stores plural types of third compressed data having different color determination results and different pieces of mode instruction information.

8. An apparatus for image processing comprising:  
a dividing section which divides an image into  
10 blocks;  
a color determining section which determines whether the image is colored or monochromatic; and  
a block color determining section which determines whether each of the blocks is colored or monochromatic,  
15 on the basis of the result of the determination by the color determining section.

9. An apparatus for image processing comprising:  
a dividing section which divides an image into blocks; and  
20 a block color determining section which determines whether each of the blocks is colored or monochromatic.

10. An apparatus for image processing comprising:  
a dividing section which divides an image into blocks;  
25 a color determining section which determines whether the image is colored or monochromatic; and  
a compressing section which compresses each of

the blocks into which the image has been divided by the dividing section, together with the result of the determination of a full image plane by the color determining section.

5           11. The apparatus for image processing according to claim 10, wherein the color determining section makes determination for each of the blocks into which the image has been divided by the dividing section, and

the compressing section compresses each of the  
10 blocks into which the image has been divided by the dividing section, together with the result of the determination for the each block which result is produced by the color determining section.

12. The apparatus for image processing according  
15 to claim 10, wherein the color determining section makes determination for the entire image, and

the compressing section compresses each of the blocks into which the image has been divided by the dividing section, together with the result of the  
20 determination for the entire image which result is produced by the color determining section.

13. The apparatus for image processing according to claim 10, further comprising compressed data extracting means for extracting arbitrary compressed  
25 data from the compressed data obtained by compressing each of the blocks, extracting the determination result from the compressed data, and generating a second

determination result from the determination result.

14. The apparatus for image processing according to claim 10, further comprising a decoding section which decodes the compressed data to generate a  
5 second determination result from the determination result produced by the color determining section and compressed together with the image; and

image processing section which executes image processing on the image in accordance with the second  
10 determination result generated by the decoding section.

15. An apparatus for image processing comprising:  
a dividing section which divides an image into blocks;

a compressing section which compresses each of the  
15 blocks into which the image has been divided by the dividing section, to generate compressed data for each block; and

a color determining section which determines whether the image is colored or monochromatic, on the  
20 basis of the compressed data for each block.

16. An apparatus for image processing comprising:  
a dividing section which divides an image into blocks,

a first color determining section which determines  
25 whether the entire image is colored or monochromatic and then outputs a first determination result;

a second color determining section which

determines whether each block of the image is colored or monochromatic and then outputs a second determination result; and

5       a third color determining section which outputs a third determination result on the basis of the first determination result and the second determination result.

17. An apparatus for image processing comprising:  
an input section to which an image is inputted;  
10       a color determining section which determines whether each line of the image is colored or monochromatic and then outputs a determination result;

15       a colored/monochromatic image generating section which converts each predetermined unit of the image into a colored and monochromatic images, in accordance with the determination result outputted by the color determining section; and

20       an image output section which outputs the colored and monochromatic images generated by the colored/monochromatic image generating section, in accordance with the determination result outputted by the color determining section.

18. An apparatus for image processing comprising:  
a plane analysis section which analyzes image  
25       plane information for each block of the image;  
a compressing section which compresses each block of the image into first compressed data;

a first code converting section which converts the first compressed data into second compressed data in accordance with the plane information so that each block of the second compressed data has a code length equal to or different from that of each block of the first compressed data; and

a second code converting section which converts the second compressed data into third compressed data so that each block of the third compressed data has a code length equal to that of each block of the first compressed data.

19. The apparatus for image processing according to claim 18, wherein the plane information indicates whether or not the plane is white.

20. The apparatus for image processing according to claim 19, further comprising a generating section which generates plane information on the entire image from the plane information for each block.

21. An apparatus for image processing comprising:  
an input section to which a colored image and a monochromatic image are inputted;

an image converting section which converts a monochromatic image format into a colored image format; and

a compressing section which compresses the colored image and the monochromatic image converted by the image converting section.



22. An apparatus for image processing comprising:

a compressing section which compresses each block of an image into first compressed data;

5 a first code converting section which converts the first compressed data into second compressed data so that the block of the second compressed data has code length equal to and different from that of the block of the first compressed data;

10 a second code converting section which converts the second compressed data into third compressed data with a variable code length;

15 a third code converting section which converts the second compressed data into fourth compressed data having a fixed code length equal to that the first compressed data; and

a decoding section which decodes the fourth compressed data.

23. An apparatus for image processing comprising:

20 a compressing section which compresses each block of an image into first compressed data with a fixed code length;

25 a first code converting section which converts the first compressed data into second compressed data so that the block of the second compressed data have code length equal to and different from that of the block of the first compressed data;

a second code converting section which converts

the second compressed data into third compressed data with a variable code length;

5       a third code converting section which converts each block of externally inputted fourth compressed data with a variable code length into fifth compressed data with a variable code length;

10       a fourth code converting section which converts the second and fifth compressed data into sixth compressed data having a code length equal to that of the first compressed data; and

      a decoding section which decodes the sixth compressed data.

24. An apparatus for image processing comprising:

15       a compressing section which compresses each block of an image into first compressed data with a variable code length;

      a first code converting section which converts the first compressed data into second compressed data with a fixed code length; and

20       a decoding section which decodes the second compressed data.

25. An apparatus for image processing comprising:

25       a compressing section which compresses an image into first compressed data with a fixed code length and second compressed data with a variable code length;

      a first code converting section which converts the second compressed data into third compressed data with

a fixed code length; and

a decoding section which decodes the first or third compressed data.

26. An apparatus for image processing comprising:

5 a compressing section which compresses an image into first compressed data;

a first code converting section which converts the first compressed data into second compressed;

a second code converting section which converts  
10 the second compressed data into third compressed data;

a third code converting section which converts externally inputted fourth compressed data into fifth compressed data having a code length equal to that of the third compressed data; and

15 a decoding section which decodes the third or fifth compressed data.

27. The apparatus for image processing according to claim 26, wherein when an image based on both third and fifth compressed data is printed on the same page,  
20 an equal sub-scanning-wise resolution and an equal sub-scanning-wise processing unit are used on a main scanning line.

28. An apparatus for image processing comprising:

a compressing section which compresses each block  
25 of an image into first compressed data;

a first code converting section which converts the first compressed data into second compressed data;

a second code converting section which converts the second compressed data into third compressed data;

a third code converting section which converts externally inputted fourth compressed data into fifth compressed data;

a memory which operates when storing, of the third and fifth compressed data, only the third compressed data, to store the third compressed data compressed for each block, in a format of the third compressed data,

the memory operating when storing, of the third and fifth compressed data, only the fifth compressed data, to store the fifth compressed data compressed for each block, in a format of the fifth compressed data,

the memory operating when storing both third and fifth compressed data, to store the third and fifth compressed data in one of the formats of the third and fifth compressed data which has a larger code length; and

a decoding section which decodes the third or fifth compressed data stored in the memory.

29. An apparatus for image processing comprising:

a compressing section which converts each block of a multivalued image into first compressed data in the predetermined format;

a first code converting section which converts the first compressed data into second compressed data;

a second code converting section which converts

the second compressed data into third compressed data in the predetermined format;

a third data converting section which converts each block of an binary image into fourth compressed data in the predetermined format; and

a decoding section which decodes the third or fourth compressed data.

30. An apparatus for image processing comprising:

a compressing section which compresses each block of an image into first compressed data with a fixed code length;

a first code converting section which converts the first compressed data into second compressed data with a variable code length;

a second code converting section which converts the second compressed data into third compressed data with a variable code length;

a third code converting section which converts each block of externally inputted fourth compressed data with a variable code length into fifth compressed data with a variable code length;

a fourth code converting section which converts the second and fifth compressed data into sixth compressed data having a fixed code length and a predetermined format; and

a decoding section which decodes the sixth compressed data.

31. The apparatus for image processing according to claim 30, further comprising:

a color determining section which determines whether the image is colored or monochromatic,

5        wherein the second code converting section converts the second compressed data into the third compressed data in accordance with the result of the determination by the color determining section so that each block of the third compressed data has a code  
10        length equal to or different from that of each block of the first compressed data; and

the fourth code converting section converts the second and fifth compressed data into the sixth compressed data having the fixed code length shorter  
15        than those of the formats of the second and fifth compressed data and having a monochromatic format.

32. The apparatus for image processing according to claim 30, wherein the fourth code converting section converts the second and fifth compressed data into the  
20        sixth compressed data in a format having the fixed code length and the same fixed code length as that of the format of the first compressed data.

Additional advantages and modifications will readily occur to those skilled in the art. Therefore,  
25        the invention in its broader aspects is not limited to the specific details and representative embodiments shown and described herein. Accordingly, various

modifications may be made without departing from the spirit or scope of the general inventive concept as defined by the appended claims and their equivalents.